

the calibration history should be described is not standardized. Owing to this, there are some cases where the calibration history cannot be described assuredly or some cases where the corresponding area after description of the calibration history cannot be retrieved accurately. In these cases, it becomes impossible to distinguish which sector is a used one within the PCA, which results in making a mistake of performing the calibration processing using a used sector.

To cope with the above problem, heretofore, there is adopted a method of detecting a detected/playback signal corresponding to an actually recorded setting signal by scanning the PCA using the optical beams and retrieving a used sector from the level thereof, as disclosed in, for example, Japanese Patent Application Laid-Open No. 11-175977.

According to the above-mentioned conventional retrieval method of the used sector, as for a sector where a setting signal is recorded with the minimum recording power (near to zero level), since the recording power is too small to detect a detected/playback signal in the retrieval method, it may be regarded as the non-used sector, even if a used-sector. Therefore, the calibration processing of the recording power may be performed by using a used sector, similarly in the conventional method, thereby failing in the accurate calibration processing.

#### SUMMARY OF THE INVENTION

In consideration of the above problem, an object of the present invention is to provide a parameter setting apparatus and a parameter setting method capable of accurately retrieving a non-used sector in the PCA and performing the accurate calibration of the recording power

by use of the above non-used sector, an information recording apparatus and an information recording method for information recording, including the above parameter setting apparatus, and an information recording medium with a setting program for setting the recording parameter recorded there in a readable way by a computer.

The above object of the present invention can be achieved by a parameter setting apparatus of the present invention for setting a recording parameter for use in optical information recording on a recording medium, by use of any one of a plurality of setting areas previously provided on the recording medium. The apparatus is provided with: a checking device for checking whether a special detected signal is optically detected or not from the setting areas; a retrieving device for retrieving a non-used area that is the setting area where no special detected signal is detected, of the setting areas, based on the check result of the checking device; a mark signal recording device for optically recording a mark signal for obtaining the special detected signal optically, in the detected non-used setting area; a setting signal recording device for recording a setting signal for setting the recording parameter, at least, in the non-used setting area excluding an area where the mark signal is recorded; and a setting device for setting the recording parameter by optically detecting the recorded setting signal.

According to the present invention, since the non-used setting area is retrieved by referring to the special detected signal, so that the mark signal and the setting signal is recorded, and the recording parameter is set by use of the recorded setting signal, it is possible to retrieve the non-used setting area accurately and set the recording

parameter accurately by use of this. Therefore use of the accurately-set recording parameter enables the accurate and assured information recording.

In one aspect of the present invention, the mark signal recording  
5 device records the mark signal at a position detected prior to the setting signal recorded in the non-used setting area.

According to this aspect, since the mark signal is recorded at a position detected prior to the setting signal, the accurate detection of the first detected position in the setting area enables accurate  
10 detection of a non-used setting area.

In another aspect of the present invention, the mark signal recording device repeats the recording of the mark signal at a predetermined interval during the recording of the setting signal.

According to this aspect, since the mark signal is recorded at a  
15 predetermined interval during recording the setting signal, it is possible to prevent from a detection mistake of a non-used setting area caused by detecting no special detected signal for a long time.

In further aspect of the present invention, the checking device is further provided with: a position retrieving device for retrieving a  
20 predicted position of the setting area on the recording medium where the special detected signal is to be optically detected; a first moving device for moving an executing device for detecting the setting signal and the special detected signal, from the retrieved predicted position, to a retrieval starting position on the recording medium distant from  
25 there at least by a distance corresponding to the predetermined interval; and a second moving device for repeating an operation of further moving the executing device again from the special detected